

## ABSTRACT

Techniques are provided for synthesizing a long coherent I and Q correlation integral at a particular frequency by synthetically combining a sequence of shorter correlation  
5 integrals at the same or different frequency. Techniques are also provided for acquiring a carrier-modulated signal with an unknown shift of the carrier frequency, and possibly some additional unknown signal parameters. These techniques involve synthesizing coherent correlation sums at a fine frequency resolution, using coherent correlation sums that are calculated at a coarse frequency resolution. This approach allows for coherent processing of  
10 the received signal over an arbitrarily long time interval, while avoiding the excessive computational requirements of traditional methods.